

RELATIVE HUMIDITY.

The percentage of mean relative humidity for the month ranges as follows: New England, from 70 to 88; Middle Atlantic states, 65 to 82; South Atlantic states, 69 to 81; East Gulf states, 72 to 80; West Gulf states, 73 to 82; Rio Grande valley, 73 to 86; Ohio valley and Tennessee, 71 to 80; Lower Lake region, 72 to 78; Upper Lake region, 70 to 82; extreme Northwest 67 to 75; Upper Mississippi valley, 69 to 81; Missouri valley, 73 to 76; Northern Slope, 54 to 79; Middle Slope, 49 to 76; Southern Slope, 57 to 78; Southern Plateau, 30 to 70; Middle Plateau, 38 to 56; Northern Plateau, 59 to 80; North Pacific region, 80 to 83; Middle Pacific region, 59 to 74; South Pacific region, 51 to 70.

WINDS.

The prevailing winds during the month of October, 1881, at Signal Service stations, are shown on Chart No. II, by arrows, which fly with the wind. In the South Atlantic and East Gulf states and in the Florida Peninsula, *northeasterly*, in the Middle Atlantic states and New England, *south to west* and *northwest*; in the Lake region, *southeast to southwest*; throughout the Mississippi and Ohio valleys and in Texas, *southerly*; in the Upper Missouri valley and the Rocky Mountain regions, *northerly*; in the Plateau regions and along the Pacific coast, *south to west*.

Total Movements of the Air.—The following are the largest total movements at Signal Service stations: Mt. Washington, 30,501 miles; Delaware Breakwater, 12,222; Portsmouth, N. C., 11,881; Wood's Holl, Mass., 11,463; Cape May, N. J., 11,256; Hatteras, N. C., 11,199; Kittyhawk, N. C., 11,094; Chincoteague, Va., 11,054; New Shoreham, R. I., 11,052; Port Eads, La., 10,358; Thatcher's island, Mass., 10,176; North Platte, Neb., 9,839; Dodge City, Kan., 9,824; Indianola, Tex., 9,809; Sandy Hook, N. J., 9,727; Sandusky, Ohio, 9,257; Barnegat, N. J., 9,120; Ft. Sill, Ind., Tyr., 9,084; Macon, N. C., 8,898; Cape Henry, Va., 8,659; Galveston, Tex., 8,575; Ft. Elliott, Tex., 8,498; Champaign, Ill., 8,263; Moorehead, Minn., 8,052. The *smallest* are: La Mesilla, N. M., 1,217; Lewiston, Idaho, 1,451; Lynchburg, 1,457; Silver City, N. M., 1,470; Uvalde, Tex., 1,743; Florence, Ariz., 1,778; Roseburg, Oreg., 1,915; Visalia, Cal., 2,285; Yuma, Ariz., 2,400; Laredo, Tex., 2,516; Dayton, Ohio, 2,587; Missoula, Mont., 2,677; Washington, D. C., 2,780; Tucson, Ariz., 2,839; Memphis, Tenn., 2,846.

High Winds.—On summit of Mt. Washington a maximum velocity of 160 miles, *northwest*, was recorded on the 16th, and for five minutes, the register showed a velocity of 200 miles per hour. These are the highest velocities ever recorded at this station. Velocities of 100 miles per hour, and over, were recorded on the following dates: 5th, 15th, 16th, 26th, 27th. Stations reporting velocities exceeding 50 miles per hour, are as follows: Kitty Hawk, 60, NE., 5th; Portsmouth, N. C., 56, NE., 5th; Cape Henry, Va., 56, NW., 25th; Bismarck, Dak., 55, NW., 31st; North Platte, Neb., 54, S., 1st; Delaware Breakwater, 52, N., 5th; and Hatteras, N. C., 52, NE., 5th.

Local Storms.—The month of October is quite remarkable for the small number of this class of storms reported. Shawano, Wis., 8th, very violent storm, blowing down trees and fences and unroofing buildings; path of storm about one mile wide; for many miles acres of forest were perfectly leveled, and in many respects the storm's path appeared as if it had been swept by fire. Knox Co., Ohio, 2d, terrific wind storm swept over the country during the afternoon, demolishing outbuildings and fences and uprooting trees. Wanton, Wis., 4th, terrible tornado swept down the valley of Wisconsin river, completely devastating a portion of the country 80 rods wide by about 6 miles in length; houses, barns, outbuildings and grist mills demolished. Rochester, N. Y., 17th, 8.30 p. m., tornado with funnel-shaped cloud passed over a small portion of the city, accompanied by a loud roaring noise; trees were uprooted and buildings damaged. Schuyler Co., Ill., 8th, terrific tornado, lasting five minutes, and leveling everything in its path; the village of Camden, containing several hundred inhabitants, had every house with the exception of two destroyed; loss to farmers in the vicinity, \$15,000. Menominee Co., Mich., 8th, tornado passed over the upper waters of the north branch of Pike river, cutting a path through the forest two miles wide and 12 miles in length; hardly a tree was left standing in the path of the storm; it is estimated that 100,000,000 feet of pine was prostrated. Tallahassee, Fla., 28th, tornado passed over the town, unroofing buildings and causing much other damage; a heavy fall of hail accompanied the storm. Cheyenne, 12th, very heavy storm of sleet and wind, prostrating all overland telegraph lines and committing other damage.

VERIFICATIONS.

Indications.—The detailed comparison of the tri-daily indications for October, with the telegraphic reports for the succeeding twenty-four hours, shows the general percentage of verifications to be 84.3 per cent. The percentages for the four elements are: Weather, 88.7; Direction of the Wind, 79.2; Temperature, 86.4; Barometer, 82.9 per cent. By geographical districts they are: For New England, 85.1; Middle Atlantic states, 85.5; South Atlantic states, 87.2; Eastern Gulf states, 90.2; Western Gulf states, 87.8; Lower Lake region, 85.6; Upper Lake region, 81.3; Tennessee and the Ohio valley, 84.2; Upper Mississippi valley, 80.9; Lower

Missouri valley, 73.9; Northern Pacific coast region, 91.7; Central Pacific coast region, 94.7; Southern Pacific coast region, 100.0. There were 56 omissions to predict (40 being due to the absence of reports from the Pacific coast, out of 3,813, or 1.44 per cent. Of the 3,757 predictions that have been made, 192, or 5.11 per cent. are considered to have entirely failed; 157, or 4.18 per cent. were one-fourth verified; 374, or 9.96 per cent. were one-half verified; 363, or 9.66 per cent. were three-fourths verified; 2,671, or 71.09 per cent. were fully verified, so far as can be ascertained from the tri-daily reports.

Cautionary Signals.—231 Cautionary signals were displayed during the month of October, 1881, of which 178, or 77.05 per cent., were fully justified by winds of twenty-five miles per hour, or over, at, or within, a radius of 100 miles of the station. Thirty-one Off-shore signals were displayed, of which 22, or 70.97 per cent., were fully justified; 28 or 90.32 per cent., were justified as to direction; 22, or 70.97 per cent., were justified as to velocity, and 3, or 9.67 per cent., completely failed. Seven Off-shore signals, were changed to Cautionary. 262 signals, of all kinds, were displayed, of which 200, or 76.33 per cent., were fully justified. The above does not include signals ordered at display stations, where the velocity is only estimated. 74 winds, of 25 miles, or over, were reported, for which no signals were ordered. 51 signals were ordered late.

NAVIGATION.

Stage of Water in Rivers.—In the table on the right-hand side of chart No. III are given the highest and lowest stages of water, as observed at Signal Service stations during the month of October, 1881. The Red, Arkansas and Missouri rivers have remained at a moderate stage throughout the month, except that the latter at Yankton was extremely low. The Ohio, Cumberland, Tennessee, Monongahela, Savannah and Sacramento rivers were extremely low, particularly the first and last named. In the Mississippi a marked contrast with other large rivers appears; a very heavy rise began the second week of the month, resulting in a flood about the fourth week, which assumed very serious proportions, causing an immense loss of property between St. Paul and St. Louis.

Floods.—*Illinois:* Quincy, 20th, river 18 feet above low water mark and rising rapidly; water 8 inches higher than the great flood of last spring; all railroads submerged and travel suspended; on the Missouri side of the river, bottoms flooded back to the bluffs; river below city fully nine miles wide. 28th, river highest since 1851; nothing can now prevent a complete inundation. Farms for a distance of 25 miles along the bottoms on the Missouri side of the river were abandoned, perhaps never to be reclaimed, everything perishable has been destroyed; no such terrible destruction and destitution ever before experienced in the history of this section. Springfield, 5th, rain-fall for past five days measured 9.96 inches, heaviest ever known; rivers converted into raging torrents and small streams into large rivers; very serious washouts on railroads, travel generally suspended. Warsaw, 22d, 35,000 acres of land submerged by the breaks in the Warsaw and Indian Grove levees; the damage to railroads, live stock and farming property make this flood the most disastrous that has ever occurred in this section; 29th, the damage to property along the Mississippi between Keokuk and Louisiana, Mo., is estimated at \$2,930,000; several days will elapse before business can be resumed at the river towns. Carlinville, 14th, hay and corn rotting in the fields; hundreds of acres under water; all streams overflowed; most disastrous flood for years. Galena, 21st, one of the principal thoroughfares of the city under water from one end to the other; City Hall and Market House, Custom House and Post Office surrounded; all railroad tracks under water and travel generally suspended. Rockport, 22d, although situated four miles from the Mississippi, a serious flood is imminent; people fleeing to places of safety; roads leading outward from the bottoms crowded with teams hurrying away with goods; hundreds of animals driven away from the flooded region. Moline, 12th, work suspended in mills; 27th, corn fields in vicinity all under water and crop will prove a total loss. Rock Island, 14th, many cellars and streets flooded in upper part of town; 17th, lower part of town flooded; families moving to escape danger; 21st, the entire lower portion of the town flooded. *Iowa:* Burlington, 24th, river reached the high-water mark of 1880; width said to be seven miles; hay stacked along the low-lands on the Illinois side is a total loss. 27th, river seven inches above the flood-tide of 1880. 31st, river continued to rise. Davenport, 12th, water so high at mouth of Rock river that nearly the whole of "Big Island" was submerged; corn fields in vicinity flooded and operations suspended in mills; trains stopped on C. M. and St. P. R. R. on account of high water; much debris, fences and remains of wood yards passing. 15th, river continued to rise; all trains for Rock Island stopped; men are kept watching and strengthening the dyke which threatens to give way. 19th, river rose two inches; street car tracks in some localities under water. 20th, river continued to rise; all of the wood side-walks afloat; streets impassable. 21st, river rising; the Davenport division of the C. M. and St. P. R. R. Co. moved their engines out of the round-house and stored them in the round-house of the C. R. I. and P. R. R. Co., for safety from damage by flood; water stopped the Holly engine at the water works. 22d, river reached the sidewalk on First avenue, and stretched from there to Iowa street in an unbroken waste of water; cars on the Peoria and Rock Island R. R. stood out 2.0 feet in the river, all tracks submerged, cellars,